Space Weather Forecast

Issued on Monday, 19 September 2022 at 13:06 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Ongoing chance of Moderate flares/R1-R2 Radio Blackout. Chance of G1/Minor Storm late day 4 (22nd)

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Low over the past 24 hours with only common class flares observed. The most notable sunspot region is a moderately sized region just west of the southern centre disc, although this remains magnetically simple and relatively stable. There are a number of other small and simple regions. A returning region is also gradually becoming more visible as a new region on the southeast limb, and this may gradually reveal some increasing complexity as it rotates on. No Earth-directed CMEs (coronal mass ejections) were observed in the last 24 hours.

Solar Wind / Geomagnetic Activity: The solar wind rose to peak 550 km/s just before midnight, due to the arrival of the fast wind from a coronal hole, before easing again to slightly elevated levels at around 450-500 km/s. The total magnetic field strength has been Moderate throughout. Brief periods where the north-south component was southward pointed were observed, however the magnetic field was more generally northward. Geomagnetic activity was Quiet to Unsettled (Kp 0-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was slightly above background throughout, but below the level for radiation storms to occur (S1 or greater).

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to be Low, but with a chance of rising again to Moderate with any notable flares from the main sunspot on the disc, or from the old region currently rotating onto the visible disc.

Solar Wind / Geomagnetic Activity: No Earth-directed CMEs are expected, although a CME which was expected to arrive late on the 18th or early 19th cannot be completely ruled out as giving a slight glancing impact day 1 (19th). Current slightly elevated solar winds are expected to continue ease towards background by day 3 (21st) with the next coronal hole sourced far wind enhancement expected either late day 4 (22nd) or just after. Geomagnetic activity will be Quiet with isolated Unsettled spells, easing to be mainly Quiet. There is the potential for activity to increase to Active to G1/Minor Storm late on day 4 (22nd).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to continue at slightly above background, although with a declining trend. Any large flares that do occur from the main sunspot on the disc will give a very slight chance of this increasing further, but likely staying below the S1 level with no radiation storms occurring.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	1	1	30
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	25	25	25	25
Very Active	R3 to R5 X	No	2	2	2	2

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	2	2	2	2
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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